

OBSTIPATION AND MEGACOLON IN CATS: DIAGNOSIS AND SURGICAL MODALITIES

N.A. SENNA

Department of Surgery, Anaesthesiology and Radiology, Fac. Vet. Med., Cairo Uni. Giza

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SUMMARY

Out of 1060 feline patients admitted to Surgery clinic, Fac. Vet. Med., Cairo Uni. and two private clinics in Cairo, during the period from August 2001 to December 2003, 37 cats (3.5%) suffered obstipation and megacolon. Domestic shorthair cats represented 46% of the total affected cats with high incidence in Siamese breed. Out of the affected males, 19 (76%) were intact while the entire females were 8 (66.7%). The age of the affected cats ranged between 8-96 months. The clinical signs, clinical examination, probable causes and diagnostic radiographic imaging were recorded and discussed. Among surgical modalities used; transabdominal manipulation, colotomies and subtotal colectomy the latter one gave satisfactory results.

INTRODUCTION

The colon has two major physiologic functions; absorption of water and electrolytes from the

luminal contents (ascending, transverse and proximal part of the descending colon) and storage (distal part of the descending colon) with periodic expulsion of the fecal material (Burrows, 1980). Obstipation is intractable constipation in which the colon and rectum become impacted with excessively hard feces that defecation cannot occur while, megacolon indicates an extreme, irreversible dilatation of a hypomotil colon. Megacolon is an important common disorder causing chronic constipation and obstipation in cats (Dimski, 1989; Sherding, 1994 and MacPhail, 2002).

Megacolon may be either primary (idiopathic; a generalized colonic neuromuscular dysfunction due to absence of the mesenteric ganglia in the distal colonic segment)) or secondary (diseases prevent normal defecation for long time). The cause of primary megacolon is still unknown, but may be due to a defect in colonic smooth muscle innervations. The probable causes of secondary megacolon were pelvic canal stenosis / obstruction, colonic / rectal adenocarcinoma, rectal

stricture, rectal foreign bodies, perineal herniation, complications of neutering / ovariectomy, vertebral disorders, nerve injury and malunion pelvic fractures (Hurov, 1985; Bright et al. 1986; Bedford, 1988; Huber and Hiltbrand, 1990; Muir et al., 1991; Schrader, 1992; Sjollem, 1992; Bright, 1990&1994; McKee and Wong, 1994; Muir et al., 1994; Trout, 1994; Ferguson, 1996; Smith and Davies, 1996; Coolman et al., 1999; Washabau and Holt, 1999; Bertoy, 2002; Lanz, 2002 and White, 2002).

In cats, mild to moderate constipation respond to conservative medical management (emollient or hyperosmotic laxatives, fecal softeners, enemas, colonic prokinetic agents and dietary management). Cisapride, a substituted piperidinyl benzamide, may be useful in the treatment of idiopathic megacolon (Hasler and Washabau, 1997). Without surgical treatment, primary and secondary megacolon may become an intolerable problem as the probable outcome is euthanasia of the affected cat (Rosin, 1993; Bright, 1990&1994; Sherding, 1994 and Washabau and Holt, 1999).

Total or subtotal colectomy offers good long-term results in cases of primary (idiopathic) and secondary megacolon. The surgical procedure is associated with few life-threatening complications although the majority of individuals will experience a transient period of loose stool formation in the immediate post-operative period (Bright et al. 1986; Rosin et al., 1988; Bertoy et

al., 1989; Bright, 1990&1994; Matthiesen et al., 1991; Rosin, 1993; Huss et al., 1994; Muir et al., 1994; Sherding, 1994; Washabau and Holt, 1999; You et al., 1999; Bertoy, 2002; Lanz, 2002 and White, 2002). Stapling technique was tried to perform an end-to-end colonic anastomosis in cats (Kudisch and Pavletic, 1993 and Kudisch, 1994). Obstipation as a result of pelvic canal narrowing could be treated by triple pelvic osteotomy to widen the canal (Muir et al., 1994 and Ferguson, 1996).

The role of cats within the Egyptian family is increased (Senna, 2001) and many owners request treatment for abnormal bowel habits in their cats (Dimski, 1989). Moreover, the available data on naturally occurring colonic disorders in cats were limited, as much of this concern was extrapolated from human studies (Burrows 1980&1986). The aim of the present work was a trial to throw a light on obstipation and mega-colon in cats and the surgical options necessary.

MATERIAL AND METHODS

The present study was carried out on 37 affected cats. These cats were collected from Surgery clinic, Fac. Vet. Med., Cairo Uni. and two private clinics for pets in Cairo, during the period from August 2001 to December 2003. The affected cats with obstipation and megacolon were traced from feline patients admitted with other disease conditions (Tab.1). Affected cats with obstipation and

megacolon were described according age, breed, sex and weights.

Causes of the condition was depended up on the list of major causes of constipation tabulated by Burrows, (1980&1986); Dimski, (1989) and Sherding, (1994). Diagnosis was based upon history, clinical observations, abdominal palpation, digital anorectal palpation and skeletal examination (pelvic limbs, hip joints, pelvis, and lumbosacral spines). Radiographic examination (plain and contrast rectal enemas using barium sulphate suspension; EL-Gomhouria Co.) was taken on lateral and ventrodorsal positions.

Colotomy and subtotal colectomy were performed after Bright, (1990 & 1994); Bertoy, (2002); Lanz, (2002) and White, (2002). The intramuscular anaesthetic cocktail included; 0.1mg/kg atropine sulphate (Misr, Med. Co. A.R.E.), 1mg/kg xylazine (Rompun; 2% solution., Bayer, Germany) and 20mg/kg ketamine Hcl (Ketalar; 5% solution., Park-Davis, USA). (Hall and Clarke, 1983 and Torad, 2000). Prophylactic course of cephaperzone sodium (Cefobid; Pfizer, Egypt) at a dose 4.5 mg/kg b.wt., IM and non-steroidal ant-inflammatory drugs (Cataflam-drops; Novartis) at a dose 1.0 mg/kg b./wt were given immediately before surgery and continued every 12 hours for 3 successive days. Clinical assessment of operated cats was performed up to 12 months postoperatively.

RESULTS

Case history and clinical evaluation

The present work was carried out on 37 cats suffered from obstipation and megacolon represented 3.5% of the total feline patients with other disease conditions. Out of the affected cats, domestic shorthair breed represented 46% (17/37). Among this group, Siamese breed represented 32.4% and Egyptian Mau 13.5% of the total affected cases (12/37 and 5/37 respectively). Out of 25 affected males, 19 (76%) were entire and 6 (24%) were castrated. Eight affected females were entire (66.7%) and 4 (33.3%) were neutered (Tab.1). The age of the affected cats ranged between 8-96 months ($34.5 \text{ months} \pm 3.92$). The body weight of affected cats ranged between 1 - 4 kg (3.29 ± 0.18). Twenty-two of the affected cats (59.5% of the total affected cases) lived mainly on meat, chicken, and fish diets, 10 affected cats (27.%) on dry and canned foods and 5 affected cats (13.5%) fed house feeds stuffs.

Owners informed that their cats were off-food, performed vigorous efforts to defecate and groaning cry without fecal passage. Owners of 6 affected cats (16.2%) mentioned that abnormal bowel habits began after changes in the litter box (to solid type) and moving cats to a new house. In eight affected longhair cats (21.6%), their owners noticed recurrent vomiting mixed with some hair. During the last period of time, the affected cats

suffered many episodes of constipation persisted from 3 days to 8 months.

On clinical examination, the affected cats showed dullness, weight loss emaciation and dehydration. Abdominal distension was a common sign in the affected cats. On palpation, many large firm faecal masses were found in the colon of all affected cats. During this palpation, cats make extra in-

valid efforts to defecate. Bloody mucus was detected in 8 (21.6%) affected cats. Perianal fistulae were detected in two affected cats (5.4%), anal sac impaction in 3 affected cases (8.1%), paraplegia in 6 cases (16.2%) and history of hind limb fractures (without surgical interference) in 7 cases (18.9%). Four queens (10.8% of the affected cats) showed these signs after 4-6 months of ovariectomy (Tab.2).

Table 1: Breed and sex of total examined cats and those with obstipation and megacolon

Total examined cats	Breed			Sex				Total (1060)
	Domestic Short-Hair	Domestic Long-Hair	Mixed breed	Males		Females		
				I	N	I	N	
	600	190	270	570	95	320	75	
Cats with obstipation and megacolon	17 (46%)	8 (21.6%)	12 (32.4%)	19 (51.4%)	6 (16.2%)	8 (21.6%)	4 (10.8%)	(37) [3.5%]

I Intact

N Neutered

Table 2: The probable causes of obstipation and megacolon in cats.

Probable causes	Number and percentage of affected cats
Idiopathic	8 cats (21.6%)
Painful conditions: Perianal fistulae	2 cats (5.4%)
Anal sac impaction	3 cats (8.1%)
Distended bladder	2 cats (5.4%)
As a complication of ovariohysterectomy	4 cats (10.8%)
Muskloskeletal affections: Paraplegia	6 cats (16.2%)
Hind limb fractures	7 cats (18.9%)
Pathological bone disorders	18 cats (48.7%)

In all affected cats, radiographic examinations revealed permanent gross dilatations of the colon with large faecal masses have diameters precludes their passage through the normal anal sphincter (Fig.1&2). The radiographic diameters of the dilated colon were 3cm. in 9 cases (24.3%), 3.5 cm in 11 cases (29.7%), 4 cm in 10 cases (27%) and 5 cm. in 7 cases (19%). Densely packed faeces were radiographically imaged throughout 75% of the length of the dilated colon in 25 cats (67.6% of the affected cats) and the entire length of the dilated colon were impacted in 12 cats (32.4%) (Fig.3&4). A very distended bladder was detected in 2 cats (5.4%). No radiographic evidences of foreign material (bone chips) in the retained feces. Several probable causes were recorded in the affected cats with obstipation and megacolon (Tab.2).

In 18 affected cats (48.7%), variable degrees of stunted growth and abnormal conformation of pelvic region and hind limbs were detected (Fig.5). The long bones showed marked decrease in bone densities, generalized demineralization (thin cortices) and relatively wide bone marrows (Tab.2). Kyphosis and lordosis were imaged radiographically in 13 cases (35.1%) (Fig.6&7). Contrast barium enemas revealed the outlines of the dilated colons and the relative stenosis of the pelvic canal (Fig.8).

Surgical modalities

Advices were given to correct the diets of these affected cats (supplementation with dietary fibers). The used laxatives and rectal enemas gave very little response. Associated surgical conditions (perianal fistulae, anal sac impaction and

distended bladder) were treated. In 10 cases (27%), milking the retained faeces (under general anaesthesia) into the distal rectum results in extraction of small number of impacted feces. This transabdominal manipulation was performed along a period of four months. Out of these treated cases, five cats were died.

Colotomies were performed in 8 affected cats (21.6%) and dilatation of the colon with gases (Fig.9) was detected 3 weeks postoperative. After one year, re-evacuation of dilated colon in 2 cases was performed but was died one week later.

Subtotal colectomy with end-to-end ileocolostomy / jejunocolostomy (the ileum or distal portion of the jejunum was joined to a segment of distal portion of the colon with removal of iliocolic valve) was performed in 7 affected cats. Reestablishing bowel continuity and correction of lumen disparity by partial closure of the larger colonic segment were done (Fig.10&11). End-to-end colocolostomy (with retained of iliocolic valve) in 4 cases.

Out of the 11 operated cases, eight cats had no recurrence of clinical signs and no long-term complications. In two cats, watery diarrhea gradually changed to semi-formed faeces of normal consistency by month 6; these cats were clinically normal at month 12. One cat had recurrence of constipation and was euthanatized after one year of medical treatment. Eight owners refuses to carry the surgical interferences as their pets suffering more enough and they prefer to leave them alone (5 cases) or euthanasia (3 cases).

Table (3): Surgical modalities used in the affected cats with obstipation and megacolon

Surgical modalities	Results
Laxatives and rectal enemas	Very little response
Transabdominal manipulation	5/16 (50%) satisfactory results
Colotomies	6/8 (75%) successful results
Subtotal colectomy	8/11 (72.7%) successful results and 2/11 (18.2%) satisfactory results after 12 months

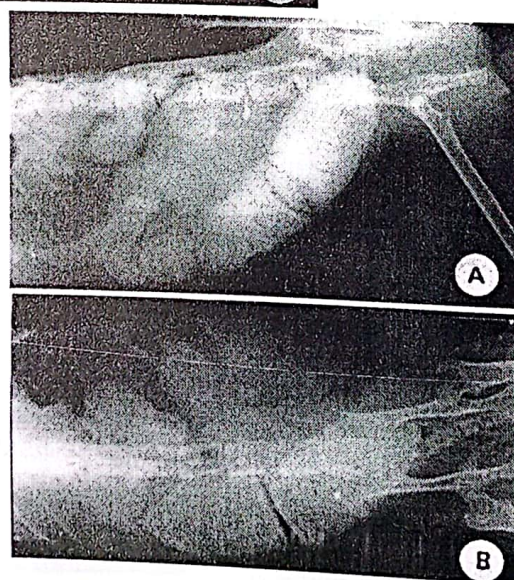
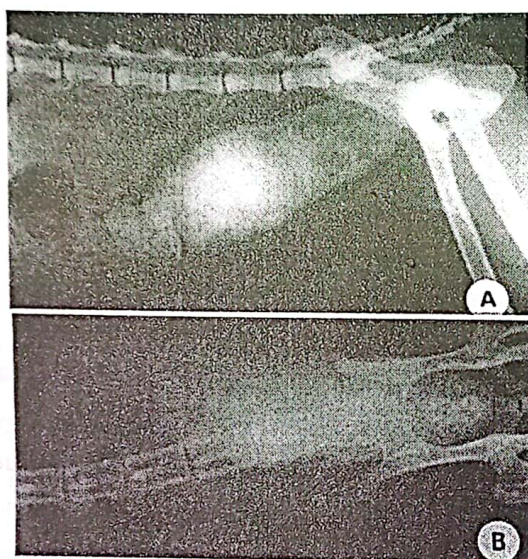


Fig.1&2: Lateral and ventrodorsal X-ray images of cats with obstipation and megacolon. Note, a permanent gross dilatation of the colon with large faecal masses have a diameter precludes their passage through the anal sphincter.

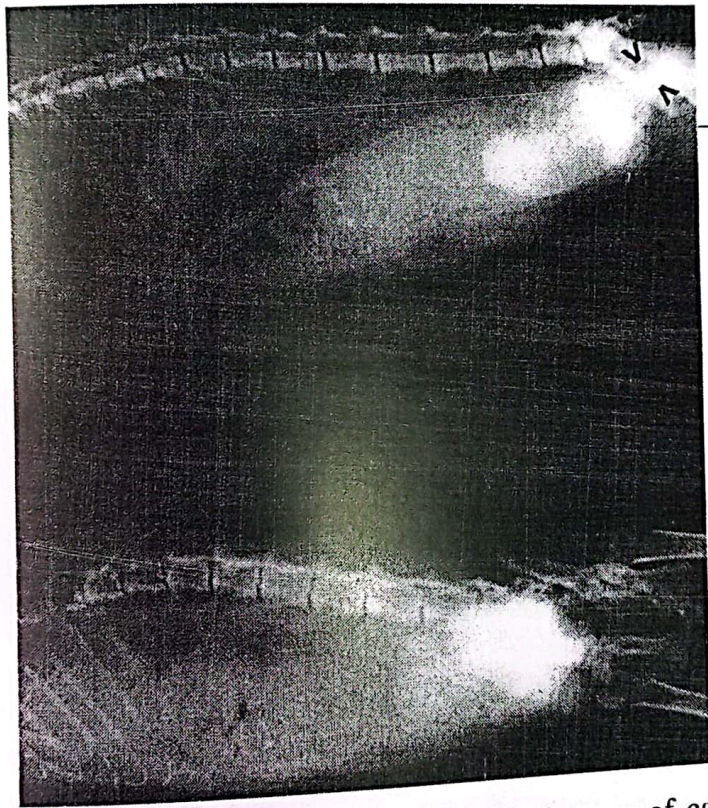
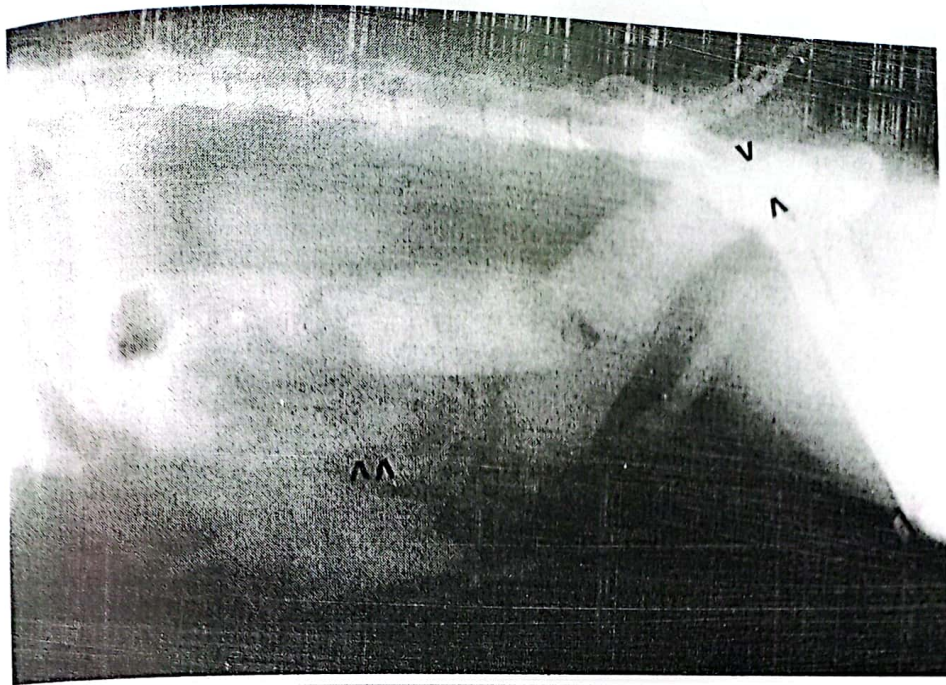


Fig. 3&4: Lateral and ventrodorsal X-ray images of cats with obstipation and megacolon. Note, the length of the impacted colon (arrow heads) and the abdominal distension.

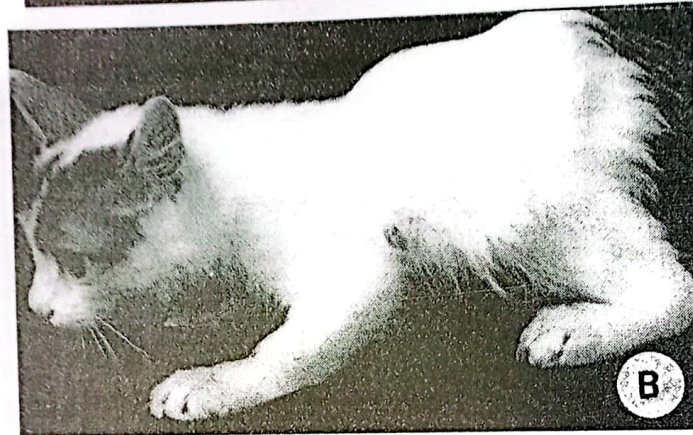
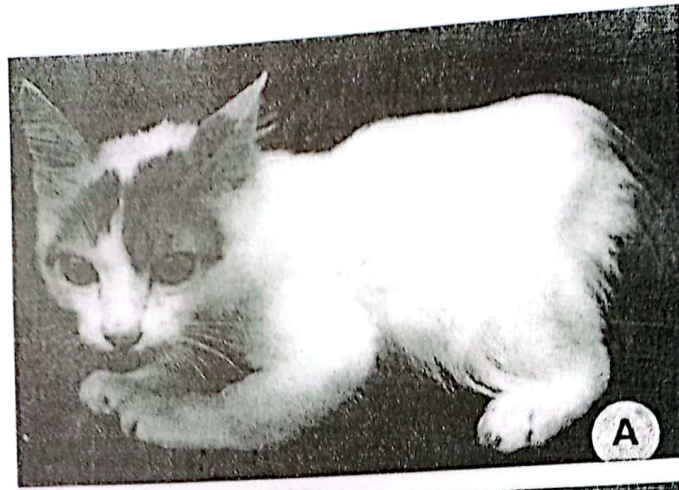


Fig. 5: A twelve-months-old mixed breed cat with megacolon (A). Note, showed stunted growth and abnormal conformation of pelvic region and hind limbs (B).

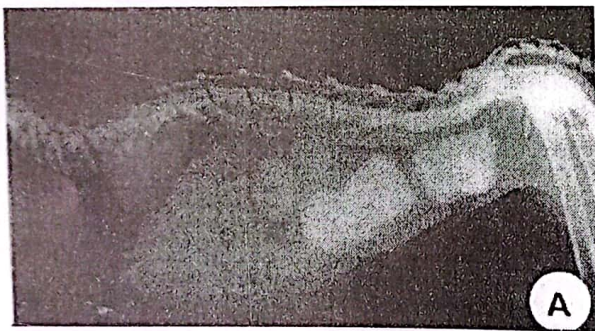


Fig. 6: Lateral and ventrodorsal X-ray images of the previous case in Fig. (5) with obstipation and megacolon. Note the pathological bone disorders; kyphosis and lordosis of the vertebral column and the narrow pelvis.

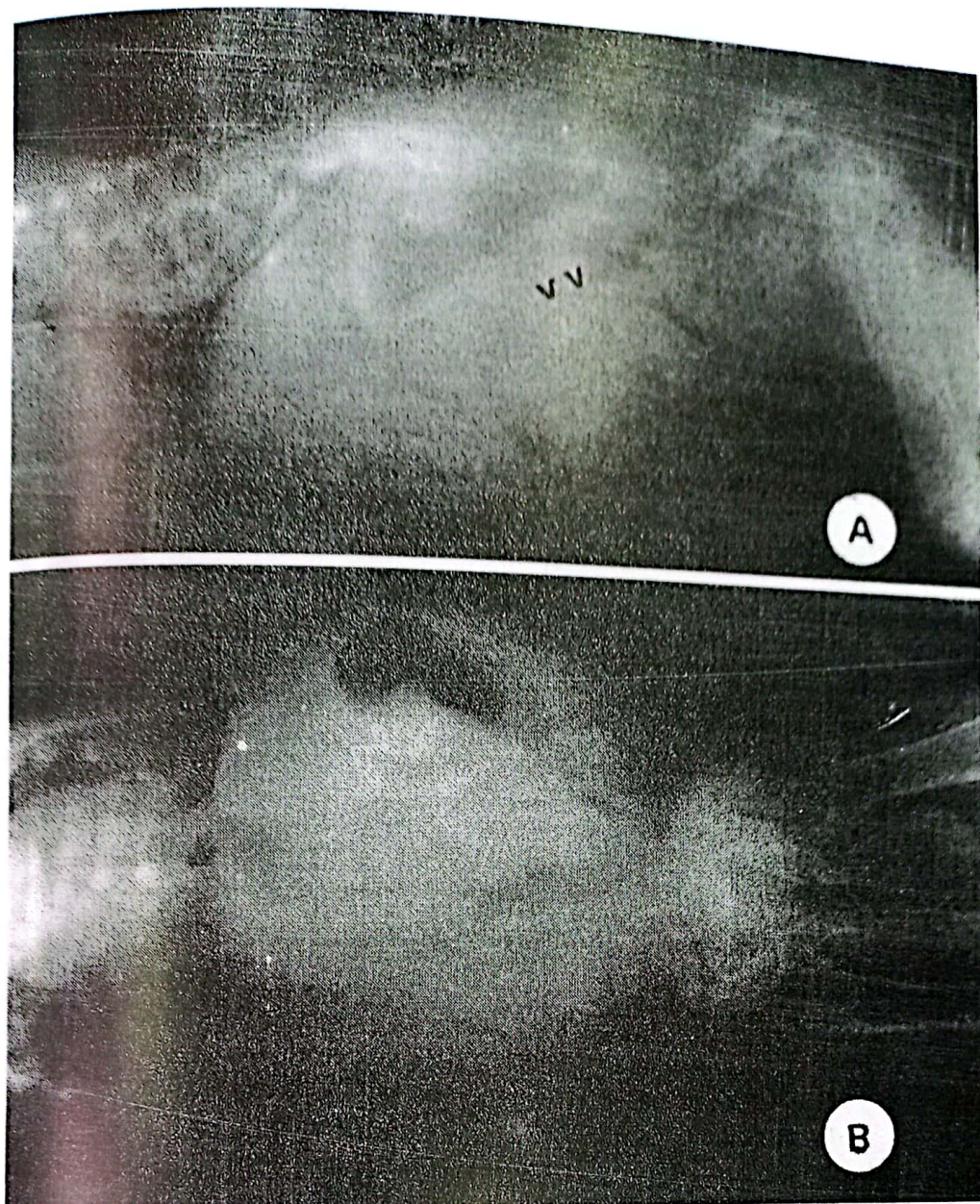


Fig.7: A lateral and ventrodorsal X-ray images of 12-months-old female mixed breed cat with megacolon (arrow heads) and pathological bone disorders (A). Note; the marked decrease in long bone densities, generalized demineralization, kyphosis and lordosis and the distended abdomen (B).

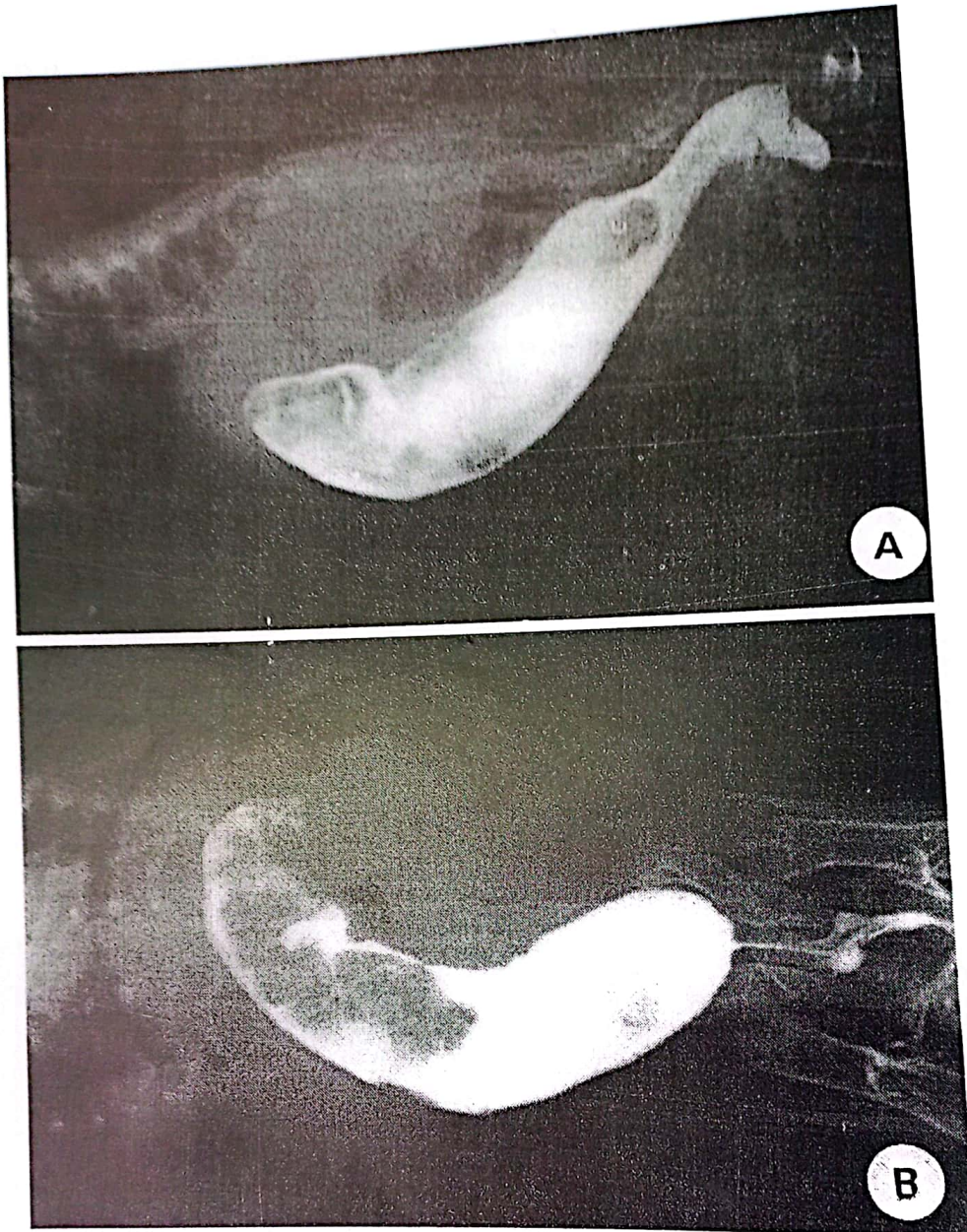


Fig. 8: Contrast barium enema; Lateral and ventrodorsal X-ray images of the previous case in Fig. (7). Note, the dilated colon and the relative stenosis of the pelvic canal.

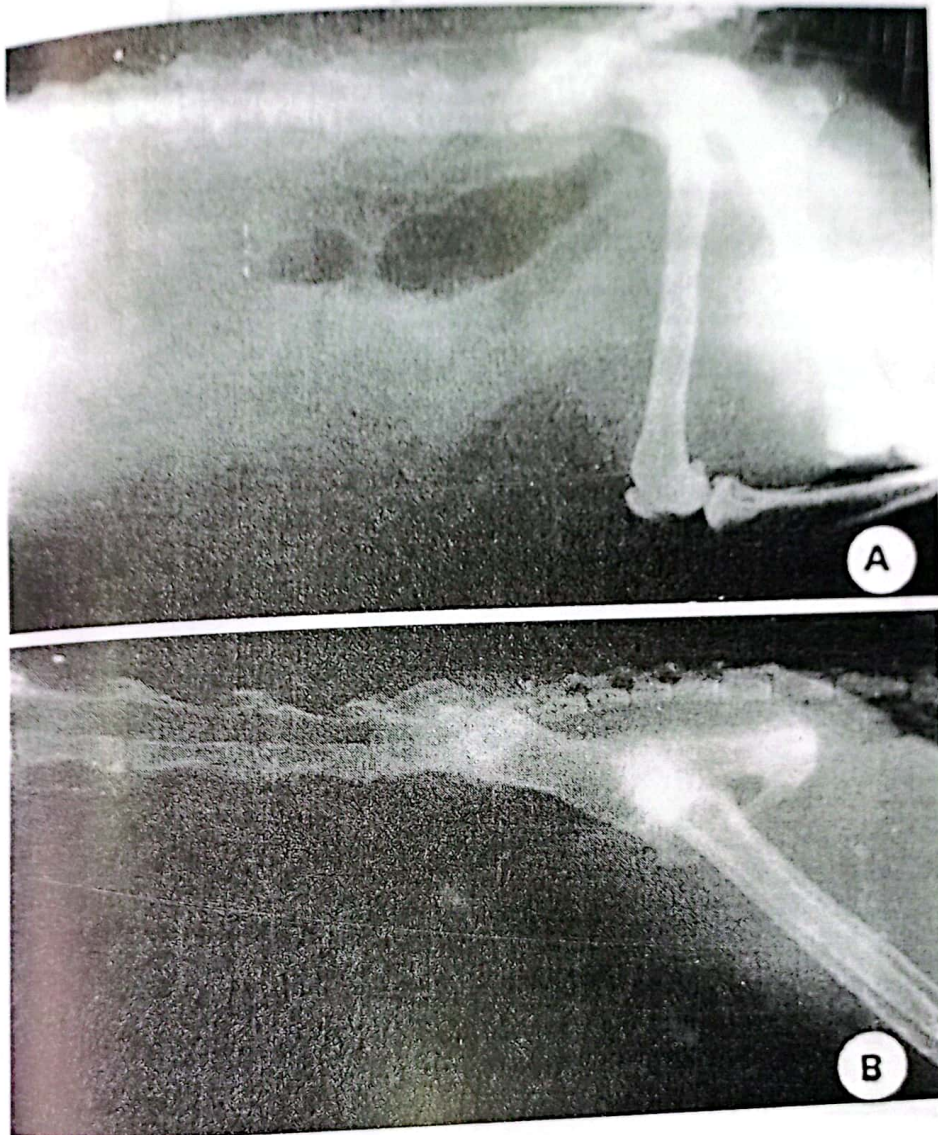


Fig.9: Lateral radiographic images of two affected cats after colotomies. Note the dilatation of the colon with gas.



Fig.10: Above (A): Lateral X- ray image of megacolon in a 3-year-old cat before subtotal colectomy. Below: Subtotal colectomy (1&2); Note the correction of bowel's luminal disparity by partial closure of the larger colonic segment (3) prior to anastomosis (4).

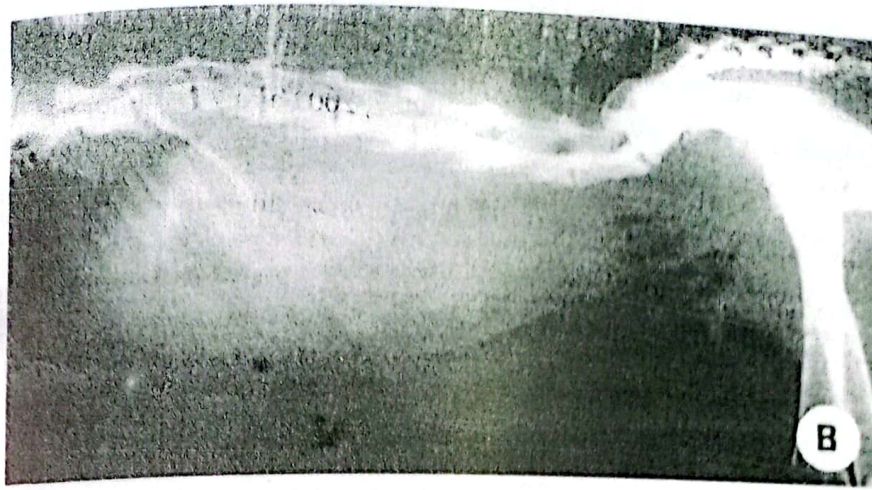


Fig.11: Lateral X- ray images of the previous case in Fig. (10) (A) after subtotal colectomy. Note the disappearance of the impacted colon after operation.

DISCUSSION

The present work was carried out on 37 cats affected with obstipation and megacolon represented 3.5% of the total feline patients (1060). In this respect, Bertoy, (2002) reported that in cats, obstipation and megacolon is not uncommon disorder of colonic structure and function.

Out of the affected cats with obstipation and megacolon, domestic shorthair cats represented 46% and Siamese breed was the predominant one. This could be explained by the wide distribution of Siamese breed in Egypt (Senna, 2001). Moreover, 22 affected cats (59.5% of the total affected cats) lived mainly on meat, chicken, and fish diets. Comparing with other breeds, Siamese kittens were more prone to hypocalcaemia because of their predilection for meat and dislike milk / milk products. Consequently, these cats

were subjected to severe skeletal deformities (kyphosis, lordosis, the vertebral column sags under the weight of the viscera especially in the lumbar region) and narrowing of the pelvic canal. These pelvic deformities interfere with the periodic expulsion of fecal material (Brown, 1975; Campbell et al. 1979; Scott, 1984; Capen, 1985; Beale, 2001 and Farag, 1991).

Regarding sex, Most of the cats affected with obstipation and megacolon were entire males (19; 76%) and females (8; 66.7%). However, in 2 affected toms (5.4%) distended bladder press over the colon could be a sequel to feline urologic syndrome (Senna, 1989). On the other hand, 4 queens (10.8% of the affected queens) were suffered the condition 4-6 months after ovariohysterectomy. This could be explained by partial extramural obstruction of the descending colon by fibrous tissue encircling or crossing it or by

fibrous adhesions of laparotomy incision (Smith and Davies, 1996 and Coolman et al., 1999).

In the present work, the age of the affected cats ranged between 8-96 months (34.5 months \pm 3.92). This observation was more or less similar to that of Dimski, (1989) and Washabau and Holt, (1999) who recorded that middle-aged to older cats were particularly at risk for chronic constipation, obstipation, and dilated megacolon. Some owners (8 cats; 21.6% of affected cases) mentioned that abnormal bowel habits began after changes in the litter box (to solid type) and moving cats to a new house. These observations by owners could not explain a complicated condition like obstipation and megacolon. Moreover cats, compared with dogs, are generally quieter, more independent and had less stressful life (stress has been implicated as a major factor in colonic disorder in man and dog)(Burrows, 1980 and Senna, 2001). On the other hand, Strombeck, (1979) reported that the defecation reflex can be inhibited or delayed by overriding cerebral input, thus allowing faeces to be retained for long periods if the cat perceives that the environment is not appropriate for defecation.

The results of clinical signs and clinical examination of the affected cats (especially the presence of many large firm abdominal masses) were more or less similar to those of intestinal obstruction. In this respect, intestinal neoplasia should be receiving a considerable attention in differential di-

agnosis (Slawienski et al., 1997; MacPhail, 2002; Lanz, 2002 and White, 2002).

The duration of clinical signs in the present cases ranged from 3 days to 8 months. Regarding this aspect, Schrader, (1992) mentioned that the duration of colonic obstruction influenced the outcome of surgical modality used.

In the present study, muskloskeletal disorders especially with relative stenosis of the pelvic canal (nutritional secondary hyperparathyroidism; malunion hind limb fractures and paraplegia) represented the most probable causes of obstipation and megacolon in cats (83.8% of the total affected cases). With respect to more than one probable cause was recorded in the same cat, idiopathic megacolon and painful conditions represented 21.6% and 13.5% of the total affected cases respectively. These results were in agreement with those of (Dietzmann, 1968; Burrows, 1980&1986; Holschneider, 1982; Wilkinson, 1984; Bright et al.1986; Dimski, 1989; Bright, 1990&1994; Muir et al., 1994; Sherding, 1994; Washabau and Stalis, 1996; Washabau and Holt, 1999; Bertoy, 2002; Lanz, 2002 and White, 2002).

Regarding radiographic diagnosis, a permanent gross dilatation of the colon (3cm.-5 cm; along with 75% to the entire colonic length) and large faecal masses have diameters precludes their passage through the normal anal sphincter were

evidences of obstipation and megacolon in cats. These radiographic evidences were confirmed in the operated cases. These results were in agreement with those of Bright et al., (1986); Bright, (1990&1994) and Sherding, (1994).

Regarding management of the condition, correction of the diets of affected cats, the used laxatives and rectal enemas gave little response. These results were more or less similar to those of Sjollem, (1992&1993); Rosin, (1993) and Washabau and Holt, (1999), who recorded that only cats with mild to moderate constipation respond to conservative medical management. Moreover, the aim of an early use of conservative medical management is likely to prevent the progression of constipation to obstipation and dilated megacolon.

Regarding surgical modalities, associated surgical conditions (perianal fistulae, anal sac impaction and distended bladder) were treated. Milking the retained faeces into the distal rectum results in extraction of small number of impacted feces. Moreover, this transabdominal manipulation took a long period of time.

Without radical surgical interferences, obstipation and megacolon may become an intolerable problem and the end result is euthanasia of the affected cats. Subtotal colectomy was performed with end-to-end ileocolostomy / jejunocolostomy and colocolostomy. Colocolostomy with retained

ileocolic valve was preferable by many surgeons however; some difficulties in anastomosis were encountered (Matthiesen et al., 1991; Bright et al., 1986 and Bright, 1994). Comparing between the findings obtained from colostomies and subtotal colectomy, the second surgical mortality gave a satisfactory treatment. Out of 11 operated cats, eight cats had no recurrence of clinical signs and no longterm complications. Three affected cats had minimal long-term effects. These results were in agreement with those of Hudson et al., (1979); Bright et al., (1986); Gregory et al., (1990); Sjollem, (1992&1993); Rosin, (1993); Bright, (1994); Ferguson, (1996); You et al., (1999); Bertoy, (2002); Lanz, (2002); and White, (2002).

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